

What is claimed is:

1. A composition comprising an effective amount of glucan capable of enhancing efficacy of antibodies.
- 5 2. The composition of claim 1, wherein the antibody is a monoclonal antibody.
3. The composition of claim 1, wherein the antibody is an
10 antibody against cancer.
4. The composition of claim 3, wherein the antibody is a tumor-binding antibody.
- 15 5. The composition of claim 4, wherein the antibody is capable of activating complement.
6. The composition of claim 5, the antibody is further capable of activating the antibody dependent cell-
20 mediated cytotoxicity.
7. The composition of claim 4, wherein the antibody is directed at the epidermal growth factor receptor.
- 25 8. The composition of claim 7, wherein the antibody is 528 or C225.
9. The composition of claim 4, wherein the antibody is directed to a ganglioside.
- 30 10. The composition of claim 9, wherein the ganglioside is GD3.
11. The composition of claim 10, wherein the antibody is
35 R24.
12. The composition of claim 4, wherein the ganglioside is GD2.

13. The composition of claim 12, wherein antibody is 3F8.
14. The composition of claim 4, wherein the antigen is CD20.
- 5 15. The composition of claim 14, wherein the antibody is Rituximab.
16. The composition of claim 4, wherein the antigen is CD25.
- 10 17. The composition of claim 16, wherein the antibody is Dacluzimab.
- 15 18. The composition of claim 4, wherein the antigen is Her2/neu.
19. The composition of claim 18, wherein the antibody is Herceptin.
- 20 20. The composition of claim 4, wherein the antigen is CD22.
21. The composition of claim 20, wherein the antibody is Epratuzumab.
- 25 22. The composition of claim 3, wherein the cancer is neuroblastoma, melanoma, non-Hodgkin's lymphoma, Epstein-Barr related lymphoma, Hodgkin's lymphoma, retinoblastoma, small cell lung cancer, brain tumors, leukemia, epidermoid carcinoma, prostate cancer, renal cell carcinoma, transitional cell carcinoma, breast cancer, ovarian cancer, lung cancer, colon cancer, liver cancer, stomach cancer, or other gastrointestinal cancers.
- 30 23. The composition of claim 1 and a pharmaceutically acceptable carrier.
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24. A method for treating a subject comprising administrating the composition of claim 1-23 to the subject.
- 5 25. A composition comprising an effective amount of glucan capable of enhancing efficacy of vaccines.
26. A composition of claim 25, wherein the vaccine is
10 against cancer.
27. The composition of claim 25 and a pharmaceutically acceptable carrier.
- 15 28. A method of treating a subject comprising administrating the composition of claim 25 to the subject.
29. A composition of claim 25, wherein the vaccine is
20 against infectious agents.
30. A composition of claim 29, wherein the infectious agents are bacteria, viruses, fungi, or parasites.
- 25 31. A composition comprising an effective amount of glucan capable of enhancing efficacy of natural antibodies.
32. The composition of claim 31, wherein the antibodies are against cancer.
- 30 33. The composition of claim 31, wherein the antibodies are against infectious agents.
34. The composition of claim 31, wherein the infectious
35 agents are bacteria, viruses, fungi, or parasites.
35. A composition comprising an effective amount of glucan capable of enhancing host immunity.

36. The composition of claim 35, wherein the immunity is against cancer.
- 5 37. The composition of claim 35, wherein the immunity is against infectious agents.
38. A composition comprising an effective amount of glucan capable of enhancing the action of an agent in preventing tissue rejection.
- 10 39. The composition of claim 38, wherein the agent is an antibody.
- 15 40. The composition of claim 39, wherein the antibody modulates T-cell function.
41. The composition of claim 40, wherein the antibody is anti-CD25 or anti-CD3.
- 20 42. The composition of claim 39, wherein the antibody modulates B-cell function.
43. The composition of claim 42, wherein the antibody is anti-CD20.
- 25 44. The composition of claim 38, wherein the tissue is transplanted tissue or transplanted organ.
- 30 45. The composition of claim 38, wherein the tissue is the host as in graft-versus-host disease.
46. The composition of claim 1, 25, 31, 35, or 38 wherein the glucan are 1,3-1,4 mixed linkage, without 1,6 branches.
- 35 47. The composition of claim 1, 25, 31, 35, or 38 wherein the glucan is of high molecular weight.

48. The composition of claim 47, wherein the molecular weight of the glucan ranges from 250,000 to 450,000 daltons.
- 5 49. The composition of claim 1, 25, 31, 35, or 38 wherein the glucan is derived from barley, oat, wheat or moss.
50. The composition of claim 1, 25, 31, 35, or 38 wherein the glucan is stable to heat treatment.
- 10 51. The composition of claim 50, wherein the composition is stable after boiling for 3 hours.
52. The composition of claim 1, 25, 31, 35, or 38 when then oral route is adopted when administered to a subject.
- 15 53. The composition of claim 52, wherein the effective dose is about ≥ 25 mg/kg/day, five days a week for a total of 2-4 weeks.
- 20 54. A method for treating a subject comprising administering the composition of any of claims 1-53 to the subject.
- 25 55. A composition for oral uptake of substance comprising an appropriate amount of carbohydrates.
56. The composition of claim 55, wherein the carbohydrate is glucan.
- 30 57. The composition of claim 56, wherein, the glucan is 1,3-1,4 mixed linkage.
58. The composition of claim 56, wherein the glucan is of high molecular weight.
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59. The composition of claim 56, wherein the substance is a peptide, protein, RNA, DNA or plasmid.
- 5 60. A pharmaceutical composition comprising an effective amount of the composition of claim 55 and a pharmaceutically acceptable carrier.
- 10 61. A method for introducing substance into cells comprising contacting the composition of any of claims 55-60 with said cells.
- 15 62. A method for introducing substance into a subject comprising administering to the subject an effective amount of the composition of any of claims 55-60.
63. A method for treating a subject comprising administering to the subject an effective amount of the composition of any of claims 55-60.
- 20 64. The method of claims 63 further comprising the substance.
- 25 65. A method for treating a subject with genetic disorder comprising administering to the subject an effective amount of the composition of any of claims 55-60 and a substance capable of correcting the said genetic disorder.
- 30 66. The method of claim 65 wherein the substance is a peptide, protein, RNA, DNA or plasmid.